

Discrete diffraction of surface magnetostatic wave in laterally coupled YIG waveguides array

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The phenomena of discrete diffraction was studied in optics both theoretically and experimentally by scanning tunneling optical microscopy in arrays of equally spaced identical waveguide elements [1]. Coupled Yttrium iron garnet (YIG) structures are of great interest at the present time due to extremely small spin-wave loss in this material and the possibility of spin-wave wave propagation control. This report shows the results of investigation of the spatio-temporal dynamics of magnetization in the laterally coupled planar YIG waveguide array by Brillouin light scattering (BLS) spectroscopy [2]. It was shown that the degree of system discreteness could be regulated by changing the external bias magnetic field angle. The dependence of coupling between the waveguide channels on the parameters of spin wave (wavenumber, frequency, power) make s the continuous regulation of spin wave path possible.

References:

- [1] Lederer F., Stegeman G.I., Christodoulides D.N. et al. // Phys. Rep. 2008. 463, 1–26.
- [2] S.O. Demokritov, B. Hillebrands, and A. N. Slavin // Phys. Rep. 2001. 348, 441–489.